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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Plant Introduction Newsletter No. 2

Rome, February 1958

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FAO/58/2/866

COMMONWEALTH MYCOLOGICAL INSTITUTE
23 JUL 1958

17. 9th Session of FAO Conference, November 1957.

The FAO project on plant exploration, collection and introduction came up for discussion under the Program of Work of the Plant Production Branch for 1958/59.

The delegate of the United States of America welcomed this new development, offered the full co-operation of the American specialists on the basis of their long experience and stressed the fact that any work which FAO might undertake should be on a regional basis. The American delegate requested that care should be taken in publicising expeditions in the proposed Plant Introduction Newsletter as the institutes, departments or gardens at which collections are grown do not wish to be swamped by requests for a share of the seeds, not always from reliable centres of research.

The project was also supported by the Australian, French, British and other delegations, generally with emphasis on the desirability of development on a regional basis. Many delegations also stressed the need for catalogues of genetic stocks of a wider range of economic crops.

The paragraphs of the Report of the 9th Session of the Conference relating to these two items read as follows:-

"The Conference recognized the basic importance of plant exploration, collection and introduction as a basis for crop improvement in general, and suggested that this project should be developed on a regional basis similar to that which is being considered in association with the European Commission on Agriculture. The Conference noted that a mailing list would be established for the distribution of a Plant Introduction Newsletter which would appear at irregular intervals as a medium for disseminating information to technicians of important activities in this field; that Member countries would be assisted as far as possible in co-ordinating, planning and conducting plant exploration missions; that national specialists would be encouraged to make detailed studies of the natural distribution and centres of diversity of the gene material from which economic crops originated.

"An important counterpart to the plant introduction project, particularly as far as bred strains are concerned, is the preparation of catalogues of genetic stocks. The Conference recognized the great importance of the FAO World Catalogues of Genetic Stocks of Wheat and Rice and of the FAO Tabulated Information on Tropical and Sub-Tropical Grain Legumes, requested that these publications be kept up to date by the preparation of supplements, and welcomed the extension of this method of collecting and disseminating information to barley, oats and coconut."

18. New Zealand: Comments on FAO project.

The Government of New Zealand was approached with regard to their opinions on the FAO project. Replies were received, through Dr. W.M. Hamilton, from Dr. E.J. Godley and Mr. L. Corkill.

Comments (4 November 1957) of Dr. E.J. Godley (then Director, Crop Research Division, Department of Scientific and Industrial Research, Lincoln, New Zealand, now Director, Botany Division, Department of Scientific and Industrial Research, P.O. Box 8018, Wellington, New Zealand):

"At present the only plants known to us of which reasonable collections are available, are such important world crops as wheat and potatoes. Breeding in both these crops is not hampered by lack of genetical material. However, such collections should be described. At present FAO lists only 22 wheats available from New Zealand, whereas a collection of over 2,500 types is maintained. We have not been able to describe these properly - we estimated it to be a full-time job for one man for at least two seasons. However, we support the proposal by FAO that there should be 'collection of information from plant breeders regarding the germ plasm banks which they maintain'.

"In other crops, collections from U.S.A. and N.W. Europe are reasonably easy to assemble, but collections from less advanced countries are rare. We are particularly interested in collections on a wide scale of the cultivated varieties and their wild relatives of Brassicas, lupins and lucerne. We think that valuable material could be collected round the Mediterranean.

"In reply to the questions whether:

"1. Plant exploration and collection on a wide scale could facilitate the present plant breeding work -

"Yes - Brassicas, lupins and lucerne. In Brassicas we know of no gene-controlled resistance to dry-rot. In lupins we seek non-shattering pods in Lupinus angustifolius. In lucerne we want all the variation we can find.

"2. FAO could facilitate the exchange of plant material and, if so, in what way -

"By making known present collections. By organising expeditions. By arranging for the housing of such collections at selected existing institutes where they will be described. We point out that FAO should not lose track of material. We know that a Dutch breeder obtained an FAO grant to collect wild lupin material in the Mediterranean. Despite repeated requests we have not been able to obtain any seed from him, even though he promised Dr. Whyte to send some to us.

"3. Such intervention by FAO would be likely to reveal breeding material at present unknown, or whether present contacts in exchange of plant material are already fairly adequate -

"It would reveal breeding material at present unknown to breeders in New Zealand."

Comments (14 October 1957) of Mr. L. Corkill (then Chief Plant Breeder, Grasslands Division, Department of Scientific and Industrial Research, Palmerston North, New Zealand, now Director, Crop Research Division, Department of Scientific and Industrial Research, Lincoln, New Zealand).

In reply to questions, with particular reference to herbage plants, whether:

"1. Plant exploration and collection on a wide scale could facilitate the present plant breeding work -

"It is very probable that plant exploration and collection would facilitate our present plant breeding work. Most of our pasture plant species have of course been introduced into the country within the last 100 years or so and it is probable that only a small part of the gene pool has been tapped. Even our rather sporadic plant introduction over the past few years has resulted in valuable plant material, e.g. the Welsh plant breeding strain of Timothy S48 was so superior to any of our New Zealand collections that it was used as a basis of selection to produce our pedigree strain. A strain of white clover from Spain and of Lotus uliginosus from Portugal, both of which are good winter producers, are at present being used in our breeding programme.

"2. FAO could facilitate the exchange of plant material and, if so, in what way -

"FAO, being an international organization, would be the most appropriate body to facilitate the exchange of plant material. This could be implemented on the lines recommended by the 7th International Grassland Congress and outlined in the FAO statement on plant exploration, collection and introduction.

"3. Such intervention by FAO would be likely to reveal breeding material at present unknown, or whether present contacts in exchange of plant material are already fairly adequate -

"It is highly probable that such intervention by FAO would be likely to reveal breeding material at present unknown to us. Admittedly, we have at present numerous contacts for the exchange of breeding material and we have no difficulty in obtaining commercial strains from other countries. But plant exploration and collection should yield plant material at present unknown to us. We have under study some 70 lines of cocksfoot which were collected by the FAO/CSIRO expedition of 1954, and it is quite probable that this "wild" material may provide genes of use in our breeding programme with cocksfoot.

"4. Other comments -

"Our main requirement is for plant material other than commercial varieties, which material can be obtained only by field collection. FAO would be the most appropriate body to organize the collection, maintenance and distribution. As far as collection is concerned, FAO should organize personnel. New Zealand, as a contributing country, could suggest regions for collection and indicate the type of material in which she is interested. I do not think that reliance should be placed on scientists of the country in which collection is to be made but their specialized knowledge of the reion would be of assistance to a collecting team. Gene centres which should be explored may of course be in primitive areas.

"The maintenance of material in the form of germ plasm banks under the general supervision of FAO should not be difficult. Seed stocks can be stored indefinitely under appropriate storage conditions.

"New Zealand, as a member country, should have access to information on all germ plasm available. This information would be periodically made available by FAO as the co-ordinating body."

19. Canada: Outstanding Plant Introductions tested at Ottawa in 1956.

"From an extensive nursery of introduced grasses and legumes established in 1956 at Ottawa it is now possible to give a tentative evaluation of this material. The usual procedure of establishing a double-row plot was followed. One row was cut for hay, recording the green weight and observing the aftermath and the other row was used for observations on seeding habit. The introductions were grouped by species and standard Canadian varieties were included for comparison.

"Forty-three lots of orchard grass were tested. Introductions from southern countries (New Zealand, Italy and France) were severely injured by the winter but not killed completely. Introductions of northern origin (Sweden, Finland and U.S.S.R.) survived without injury. The best yielding lot was Tardus II (1947-397) from Sweden which produced almost double the green yield of that of our ordinary commercial. Two Finnish introductions (1947-354 and 1947-385) yielded only slightly less than the Swedish variety.

"Twelve lots of brome grass from Germany, France, Sweden, Hungary, Switzerland, U.S.S.R. and Australia were tested. Two lots from the U.S.S.R. and one from France yielded slightly more than Parkland. The U.S.S.R. selections were, however, coarse-stemmed and of poor leaf texture.

"Timothy introductions from a wide range of sources were tested. Four lots from Germany and one from France outyielded Climax but did not excel it in leafiness and forage value. All timothy in introductions are now badly attacked by foliar diseases.

"In other grass species under test an introduction of tall fescue from the U.S.S.R. and one from Finland gave higher yields than Ottawa 39. A red fescue variety from the Ukraine outyielded Duraturf by a substantial margin. In reed canary grass our own Ottawa selection 1133-7, outyielded all introductions. The U.S.S.R. furnished an outstanding strain of Poa pratensis which was considerably more vigorous and growthy than the Delta check. It was also quite free from mildew.

"There were very few promising introductions among the legumes. In the alfalfa group none possessed the all-round merits of Vernal. A U.S.S.R. introduction was a heavy yielder of first-cut hay but showed early dormancy and poor seed habit. Red clover and alsike introductions were all severely hit by the winter and nothing of merit survived. Ladino clover survived somewhat better with the most promising entry coming from France. This lot was hardy, vigorous and leafy. An extensive group of trefoils was tested, of these two were outstanding. One came from Australia and the other was from Michigan State College (1893-4854). The latter yielded more green forage than our best line of alfalfa.

"It would appear from these preliminary trials that we have obtained some material with distinct possibilities. It is planned to increase the above introductions to the extent where small amounts of seed will be available to our plant breeders."

(The above article by R.W. Robertson appears in "Forage Notes", Vol.3, No.3, issued by Forage Crops Division, Experimental Farms Service, Department of Agriculture, Canada, September 1957, pp.29-30).

20. Canada: Species of Lotus required for breeding programme.

Dr. T.M. Stevenson, Chief of Forage Crops Division, Central Experimental Farm, Ottawa, states that his Division is interested in assembling as many species as possible of the genus Lotus, with particular reference to introductions of the following:-

Lotus ornithopodioides	L. strictus
L. peregrinus	L. tenuis
L.creticus	L. angustissimus
L. uliginosus	L. corniculatus

This material is required for use in a new plant breeding project which is being commenced this year. Lotus corniculatus has been a promising species for long-term pastures in eastern Canada but all the varieties so far available have certain serious weaknesses. They are susceptible to various diseases and have poor seeding habits as well as poor seedling vigour. Since it is not known where the necessary characteristics might be obtained, the Canadian breeders are interested in obtaining as wide a selection of species as possible of the genus Lotus in the form of small samples of each. (See footnote on page 12).

21. U.S.A.: Plant exploration 1956 - ornamentals in Southern Japan.

A plant exploration to investigate wild and cultivated ornamental plants was conducted in Japan by the U.S. Department of Agriculture from 30 September to 23 December 1956. This undertaking was the first of a series of ornamental plant explorations resulting from a co-operative agreement between the Agricultural Research Service, U.S.D.A., and the Longwood Gardens of Longwood Foundation Inc., Kennett Square, Pennsylvania. The collections being centred in Southern Honshu, Kyushu and Shikoku, it was possible to investigate the extensive broad-leaved forests in remote regions of Southern Japan. Among the many ornamentals native to warm temperate Japan which have become components of American gardens in the southern United States are: Ardisia crenata, Camellia japonica, C. sasanqua, Fatsia japonica, Ilex crenata, I. integra, Ligustrum japonicum, Osmanthus ilicifolius, Pittosporum tobira, Podocarpus macrophyllus, Raphiolepis umbellata, Rhododendron spp., and Viburnum odoratissimum.

22. U.S.A.: Herbage plant collection in southern Europe, 1958.

During the 4 months between 21 May and 20 September 1956 Dr. Howard S. Gentry and Dr. Harry A. Schoth visited Italy, Spain, Switzerland, France, Germany, Belgium, the Netherlands, Denmark and Sweden to collect seeds of grasses and legumes of primary concern to specialists in the north-eastern region of the United States. Collecting work was done mostly in certain regions of the Apennines, the Pyrenees and the Alps.

The U.S. Department of Agriculture hopes to send Dr. Howard S. Gentry into Southern Europe again in 1958, concentrating particularly on areas of Greece, Italy and Yugoslavia. According to a letter from Dr. Howard L. Hyland of 3 December 1957, the preliminary plans were that Dr. Gentry would stop in Spain and Portugal for a short period and then proceed direct to Greece, followed by Yugoslavia and Italy.

23. U.S.A.: Storage of cotton seed.

From experiments conducted by the Agricultural Research Service of the United States Department of Agriculture at Knoxville and other centres, it has been concluded "that the safe storage of dry cottonseed without special control of temperature is limited to somewhat less than 15 years. In cool storage (70° F. or below), very dry seeds may remain highly viable for 25 or more years with progressively greater life expectancy at lower temperatures."

(SIMPSON, D.M. 1957. Long-time storage of cottonseed. Agronomy Journal, Vol.49, No.11, pp.608-609)

24. Mexico: Natural distribution of species of Sporobolus.

There are in Mexico 1,000 species of Gramineae, representing 160 genera. Of these the following 20 genera are either best known or more important than the remainder:-

Andropogon	Lycurus
Aristida	Muhlenbergia
Bouteloua	Panicum
Cathestecum	Paspalum
Chloris	Pennisetum
Distichlis	Scleropogon
Elyonurus	Setaria
Enneapogon	Sporobolus
Eragrostis	Trichachne
Hilaria	Tridens

Efraim Hernández X., of the Escuela Nacional de Agricultura, Chapingo, Mexico, and Fiacro Martínez M., Técnico de la Oficina de Estudios Especiales, S.A.G., have described and mapped the distribution of the following species of Sporobolus in Mexico:-

S. pulvinatus	S. flexuosus
S. airoides	S. indicus
S. contractus	S. poiretii
S. cryptandrus	

(HERNANDEZ X., Efraim, and MARTINEZ M., Fiacro. 1957. Conozca los Zacates Nativos de Mexico - el genero Sporobolus. Agricultura Técnica en México, No.4, pp.8-11).

25. South America: Gene centres.

Following the information given under item 10, Professor H. Brücher, Departamento de Investigaciones Científicas, Universidad Nacional de Cuyo, Mendoza, Argentina, has provided us with the following short bibliography of his publications on the genera and species which have their centres of distribution in the Bolivian/Argentinian mountain region:-

(a) Phaseolus aborigineus Burk. die mutmassliche Stammform der Kulturbohne. /The presumed original form of the cultivated bean/. Der Züchter, XXIII, 1953. (With Prof. A. Burkart).

(b) La importancia de las altas montanas como geneocentros de las plantas cultivadas y como fuente de genes de resistencia. /The importance of the high mountains as gene centres of cultivated plants and as a reservoir of genes for resistance./ Ciencia e Investigacion, IX, 1953.

(c) Argentinien, Urheimat unserer Bohnen. /Argentina, original home of our beans/. Die Umschau, 1954.

(d) Origen y Filogenia de los Cereales. /The origin and phylogeny of the cereals./ Editorial Acme-Agency, New York/Buenos Aires, 1955, pp.138.

(e) Probleme der Abstammung der Kulturkartoffel. /Problems of the origin of the cultivated potato/. Naturwissenschaftliche Rundschau, 1951.

(f) La importancia de las especies tuberiferas de Solanum del NO Argentino como fuente de resistencia a las enfermedades. /The importance of the tuber-bearing species of Solanum in the north-west Argentine as a reservoir of resistance to disease./ Revista de Botanica Lilloa, XXVI, 1953.

(g) 7 other articles in Der Züchter, Zt. f. induktive Abst. u. Vererbunsglehre, which concern specific problems in Solanum published during 1955/57.

Prof. Brücher states, in a letter dated 9 November 1957, that there are in the Bolivian/Argentinian mountain region important genes for resistance against Virus X, Virus Y, Phytophthora, Heterodera rostochiensis, and Leptinotarsa decemlineata, and also against frost and drought in Solanum and against Colletotrichum in Phaseolus. In this region has also been found the wild bean, the wild Ullucus, and an astonishing diversity and gene variability in Cucurbita, Capsicum and Zea mays; also Solanum vernei, the probable ancestor of the domestic potato.

Prof. Brücher plans to make the largest possible collection of wild and primitive species of cultivated plants which have their origin in Argentina, Bolivia, Peru and Chile, in the company of Academician Dr. Zhukovsky, head of the Institute for Plant Industry, Leningrad, and other collaborators.

26. United Kingdom: Dactylis for Aberystwyth.

We are informed that the Welsh Plant Breeding Station, Aberystwyth, is trying to assemble as wide a collection as possible of ecotypes of Dactylis. The Director would therefore greatly appreciate seed samples of any type of Dactylis from the natural habitat of the various species of this genus.

27. Sweden: Expedition in Mediterranean countries, 1956.

With reference to the earlier item on this subject (No.6), Dr. S. Ellerström informs us that the collected material was sown and planted in Spring 1957, and that it developed satisfactorily in spite of bad weather during the vegetative period. It has been possible to harvest seed from most of the

annual material. Apart from the collection of cereals and large seeded legumes, the annuals have developed poorly and seem to be of less interest for Swedish conditions. The perennial grasses and legumes have, on the contrary, in many cases shown vigorous growth and may give practical results, provided they are sufficiently winterhardy. Some of the perennial grasses seem to be quite resistant against the various diseases which usually attack plot material in Sweden in the autumn. This was especially the case with Hordeum bulbosum, which also showed a marked variation in morphology and vigour, some collections being extremely vigorous. Since both diploid and probably autotetraploid types have been reported in Hordeum bulbosum, the Swedish collection may be used for a cytological study of some of the problems relating to autopolyploidy in nature. For this purpose, Dr. Ellerström of the Swedish Seed Association, Svalöf, Sweden, would greatly appreciate receiving seed samples of Hordeum bulbosum from the natural environment throughout its whole range of distribution. He would be glad if seed samples could be accompanied by a reasonably detailed note regarding the localities of the different collections and, if possible, the size of the populations at each point of collection.

28. U.S.S.R.: Cotton collection.

Five thousand different varieties of cotton are growing in an experimental station near Tashkent, the capital of Uzbekistan. Among them are new varieties of high-yielding cotton evolved by Soviet breeders; one bush variety has leaves which fall as the boll ripens, making it easier to pick the cotton by machinery. About two tons per acre are being obtained from this variety on experimental fields.

Breeders at this station have just produced ten new varieties of cotton, all with high yields, resistance to disease and producing long, strong fibre.

(Soviet News No.3729, 18 November 1957, p.120. Published by the Press Department of the Soviet Embassy, London.)

29. Iran: Spelta and emmer wheats.

In their paper on the occurrence of Triticum spelta L. and Tr.dicoccum Schübl. in Iran, Professor H. Kuckuck* and Dr.E.Schiemann** describe the occurrence of Tr.spelta and intermediates between Tr.spelta and Tr.aestivum on a plateau at 2,000 to 3,000 m. above sea level in the Baktiari region near Isfahan, Iran, where this crop is being grown by farmers, presumably since antiquity.*** The Iranian spelt shows little morphological variability and conforms in its major characters to the European spelt. A remarkable character is the frequency of three-grain ears. Pending the outcome of the genetical analysis of the material collected in Iran, the authors have refrained from discussing the phytogenetical connection between the European and the Iranian spelta, particularly with regard to McFadden's theory on the origin of Tr.spelta and its free-threshing hexaploid relatives.

* of the Institut für Gärtnerische Pflanzenzüchtung der Technischen Hochschule, Hanover, Western Germany.

** of the Forschungsstelle für Geschichte der Kulturpflanzen in der Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Berlin-Dahlem.

*** KUCKUCK, H. and SCHIEMANN, Elisabeth. 1957. Über das Vorkommen von Spelz und Emmer (Triticum spelta L. und Tr. dicoccum Schübl.) im Iran. Zeitschrift für Pflanzenzüchtung, Vol.38, No.4, pp.383-396.

A.R. Kranz has made studies of population genetics of primitive Iranian types of rye which were also collected by Prof. H. Kuckuck during his FAO assignment in that country.

(KRANZ, A.R. 1957. Populationsgenetische Untersuchungen am iranischen Primitivroggen. Zeitschrift für Pflanzenzüchtung, Vol.38, No.2, pp.101-146.

30. Thailand: Ninth Pacific Science Congress.

A Symposium on Tropical Horticulture was held in the Division of Crop Improvement on 25/26 November 1957 under the chairmanship of Mr. F.P. Pansiot, FAO, Rome. Mr. Pansiot described the work now being undertaken by FAO in the field of plant collection, introduction and exchange, with special reference to horticultural plants. Mr. L.B. Thrower, FAO, Indonesia, gave his ideas on the ways in which plant exchange could be organized between Indonesia and other countries in South and South-East Asia. Arising out of this discussion, the following resolutions were approved:-

(1) The Ninth Pacific Science Congress,

Considering the importance of international exchange of new and improved types of agricultural and horticultural crops in South and South-East Asia and noting the action proposed by FAO to improve the exchange of information between plant breeders throughout the world,

Warmly supports the FAO proposals for international collaboration concerning plant exploration, collection and introduction in the agricultural and horticultural fields for such measures as the assembly and publication of information on living plant collections and on plant collecting expeditions, and the planning of such exploration missions;

Suggests that a world list of genetic stocks of sugar cane be prepared by FAO on the same lines as those already published for rice and wheat.

(2) The Ninth Pacific Science Congress,

Considering that a regional plant introduction centre might be operated more efficiently and economically for the benefit of participating countries in South and South-East Asia and that such a centre could be better staffed and equipped than a number of small centres established by the various countries of the region,

Recommends to the governments and international bodies concerned that the possibilities of establishing in South and South-East Asia a regional plant introduction centre and germ plasm bank be studied.

31. South Pacific Commission: Plant collection and introduction.

Extract from the report of the Eighth Meeting of the South Pacific Commission Research Council (See also item 8):-

"53. The Council notes the conclusion reached by the Commission at its Sixteenth Session and its decision to curtail the Commission's association with the plant introduction station at Fiji, and the decision to appoint a plant introduction officer.

"54. The Council notes that, with Commission assistance, the Fiji authorities have developed the Nadururloulou Plant Introduction Station over a period of seven years, have published records of the introduction of economic plants from many sources and have distributed a number of these to territories throughout the region. It is understood that the controlling authority is now engaged on an appraisal of and a report on the collections at the station and will continue a programme of exchange and supply of plant material which is normal to such an organization.

"55. In view of the valuable collection of clonal material of economic plants assembled under the seven-year programme, it recommends that the Fiji authorities be urged to maintain such clonal material for five more years and make it available for distribution to territories in the region which may request such planting material for their Plant Introduction Stations or Quarantine Stations.

"56. The Council recommends :

(a) that quarantine stations for the primary introduction of clonal plant material from areas outside the South Pacific region be limited to stations where adequate pathological and entomological supervision can be maintained;

(b) that a clear distinction be made between plant introduction stations and quarantine stations as described in the above paragraph;

(c) that the movement of plant material in bulk lots be restricted to a minimum, but when such movement is necessary, that full precautions be taken to prevent the carrying of diseases or pests;

(d) that the Commission's activities with plant introductions be concentrated between the territories within the region, but with the prior approval of the territorial officials where introductions are intended.

"57. The Council recommends that the Commission's plant introduction officer's terms of reference be modified as follows:

(a) completing and keeping up to date the inventory of the region's economic plants by species; and a running inventory of new introductions and newly released selections;

(b) ensuring permanent liaison with the main introduction and quarantine stations in the region;

(c) giving appropriate attention to the collection of economic plants of the introduction garden at Nadururloulou;

(d) establishing and keeping up to date documentation on the species and, where possible, varieties of economic plants of possible value to South Pacific territories and encouraging their introduction;

(e) disseminating this information to appropriate officials in the territories and ensuring through the Commission's Quarterly Bulletin publicity for introduced plants when these are available for distribution;

(f) studying:

(i) problems encountered in the field of plant quarantine in connection with their introduction;

(ii) problems related to transport, propagation and distribution of plant material.

"58. The Council takes note of the tentative list in Proceedings of the Sixteenth Session, para. 25(f), and has no recommendation of modification at this time other than the inclusion in the list of forage and pasture plants."

32. Southern Rhodesia: Breeding of Pennisetum millets.

The plant breeding programme at the Matopos Research Station, Private Bag 19K, Bulawayo, Southern Rhodesia, is to be extended to include in the first instance the Pennisetum millets. The Officer in Charge of this station, Mr. J.M. Rattray, would like to obtain seeds of varieties of these millets from any country in which they are cultivated. At the present stage, the interest in Southern Rhodesia is only in the genus Pennisetum not the millets belonging to the genera Panicum, Setaria and Echinochloa.

33. Origin and distribution of Saccharum.

The cultivated sugar canes include three species: (a) the "noble" or the tropical canes belonging to Saccharum officinarum L., not known in the wild state; (b) the North Indian canes, thinner and poorer in sugar content and grown for centuries in northern India, belonging to S. barberi Jesw.; and (c) the Chinese canes and the Pansahi group of Indian canes, which are somewhat similar in appearance to the North Indian canes, belonging to S. sinensis (Roxb.) Jesw. The cultivated canes grown in different parts of the world are the products of extensive hybridization among S. officinarum, S. spontaneum, S. barberi, and S. sinensis, having various dosages of S. spontaneum L., the wild cane, in their parentage.

Dr. S.K. Mukherjee, of the Horticultural Research Station, Krishnagar (Nadia), West Bengal, India, has attempted to work out the origin of the genus Saccharum from phytogeographical data corroborated by morphological, cytological and genetical evidence. His conclusions are as follows:-

"The distribution of Saccharum and its congeners shows that Erianthus has the highest number of species, twenty-eight, and is most widely distributed in Asia, Europe, and America. The majority of the species of Erianthus occur in India, particularly on the slopes and foothills of the Himalayas in eastern India and in America. Saccharum has in all five species occurring in India, Malaysia, and China, of which four occur in India. Sclerostachya has three species, two of which are found in India, and Narenga has two species, distributed in India, Indochina and China. Hence the maximum concentration of species belonging to these four genera is in India.

"It is suggested that the Saccharum complex originated in the Indo-Burma-Chinese region and spread to adjoining areas. It is quite likely that Saccharum, Sclerostachya and Narenga had a common origin in Erianthus. It is significant that some species of Erianthus have the lowest chromosome number (2n = 20) in the

Saccharum complex and that E. procerus (Roxb.) Raizada, E. arundinaceus (Retz.) Jesw., and E. elephantinus Hook. f., occurring in northeastern India, look very much like sugar cane in their robust culms. Further speciation in Saccharum might have taken place by polyploidy and hybridization. Useful mutants, such as forms with a high sugar content, have been perpetuated through clonal propagation by human selection, namely, S. barberi in India and S. sinensis in China; S. robustum has, on the other hand, evolved by natural selection in New Guinea. S. officinarum is also indicated to have originated in India, because the origin of S. barberi in India by hybridization of S. officinarum with S. spontaneum presupposes the presence of the former species in India from very early days. Further evidences in support of this view are presented in the paper."

(MUKHERJEE, S.K. 1957. Origin and distribution of Saccharum. Botanical Gazette, Vol.119, No.1, pp.55-61).

All correspondence with regard to the above items should be addressed to the institutes or specialists concerned, or to: Dr. R.O. Whyte, Plant Production Branch, Agriculture Division, FAO, Rome, Italy. It is regretted that this Newsletter is available only in English. Those wishing to be included on the mailing list for further issues of these Newsletters are requested to inform the above if they have not already done so.

Footnote to Item 20:

The following is an extract from a letter just received from Dr. Stevenson:

"The countries in which we would be particularly anxious to get seed collections from would be Belgium, British Isles, Denmark, France, Germany, Hungary, Holland, Italy, Poland, Switzerland, Sweden and the U.S.S.R. We would like if possible to get samples of seed of any of their strains which are being produced in the countries on a commercial basis as well as any native material which may be available in those countries, and we are particularly interested in Lotus corniculatus although if there are other species that have some promise from the standpoint of agricultural value we would also be interested in those."